

these branches from one another has, first of all (and we think with no exaggerated estimate of the gap to be marked out), removed the Leptocardii altogether from association with the other fish, and not only from association with them but from association with the remaining classes of Vertebrates. They stand alone as the group Acrania, whilst the remaining Vertebrata are the Craniata. The five remaining groups of Müller's fishes find their place with the Craniata, but one group is separated within that large division as having no jaws, no limbs, and an unpaired nostril; these are the Cyclostomi, which are placed by Haeckel apart from all the remaining Craniate Vertebrates. The steps of structural differentiation which must be passed through to connect the Lampreys with the lowest of the remaining groups of J. Müller's Pisces seems to warrant this. They, the Dipnoi, Ganoidei, Selachii, and Teleostei, all belong to the large division of the double-nostriled, jaw-bearing Craniata; but Haeckel cannot feel that the logic of his method is fully carried out, if he does not mark more emphatically the divergence of the structural characters of Dipnoi from those of the remaining and dominant classes of Fish. The class of Fishes is restricted to the three sub-classes of Selachii, Ganoidei and Teleostei; of which the first are the nearest representatives of the common ancestors of the Ganoidei and Teleostei, whilst the Dipnoi form a separate class of the Gnathostomous Craniate Vertebrata, reaching well forwards in the direction of the Amphibia, which were derived from Palæozoic Dipnoi, these in turn having been derived from Ganoidei. No doubt, it would not be possible to make any distinction between the ancestral Ganoidei and Dipnoi of Palæozoic times, had we them all before us; but that is no reason why, in framing our classifications, we should not use such breaks and divisions of groups as will best indicate in the tabular form the branching relationships of these and neighbouring organisms. The consideration of a case like the one just discussed renders it very obvious that the whole method and point of view of the naturalist who attempts to make classification the expression of the most important laws of organic structure, and therefore a genealogy, is different from that of the naturalist who endeavours to make his groups as few as may be convenient, and such that a large number of propositions can be affirmed with regard to them. The work of the latter is marred by adhesion to a conventional form, that of the former is inspired by a life-giving theory.

The absence of illustrations to Prof. Carus's "Handbuch" is not to be considered as a deficiency. In the first place, adequate illustration would immensely increase the price of the work; in the second place, we have already the "Icones," which may serve excellently as an atlas for much of the second volume. What we want now from Prof. Carus is another volume of "Icones," to contain illustrations of the Vertebrata.

E. RAY LANKESTER

OUR SUMMER MIGRANTS

Our Summer Migrants. By J. E. Harting, F.L.S., F.Z.S. (Bickers and Son, 1875.)

AMONG the many detailed differences between the lives of country and town residents there is one which has a marked influence on the lines of thought

adopted by each. The townsman as a rule finds that his numerous avocations—more numerous as they must be to enable him to survive in the severer competition for a livelihood that is associated with the extra expense involved in a non-rural life—give him but little time or need for simple physical exercise as such. He has to form his ideas of the outside world by noting, as he passes through various thoroughfares, such things as attract his attention whilst he is on his way from one duty to another. When his work is over, his great idea is rest. The animated creation, humanity excepted, is a sealed book to him. The case of the country resident is very different. Either his slow-moving occupation in the open air allows him ample opportunity for looking around him, or he is compelled to "take a walk" in order to overcome the injurious influence of a sedentary employment. The charms of scenery soon, from frequent repetition, lose much of their fascination, and the observation of the surrounding changes continually occurring in the animated world become the chief objects of attraction. Of these none are more interesting than the movements of the birds, especially of those species which, instead of taking up their continuous abode with us, only descend to visit our shores during those seasons of the year which best suit their delicate constitutions. These, our summer migrants, form the subject of the work before us; one which will be particularly attractive, as here presented, to all who have any predilections towards ornithology or the observation of natural phenomena, both on account of the valuable information it contains and the particularly elegant way in which, both typographically and as far as binding is concerned, the book has been brought out, and Bewick's accurate engravings have been reproduced.

Mr. Harting's object has not been to write a systematic work on the subject for beginners, but to collect the results of his own and other more recent observations, both as to the exact dates of arrival and departure of the migratory species of our avifauna, as well as attested facts with reference to the localities which they inhabit as their winter-quarters. Prof. Newton's new edition of "Yarrell's British Birds," Colonel Irby's "Ornithology of the Straits of Gibraltar," and the investigations of the late Mr. Edward Blyth, are amongst the most important sources from which the author is enabled to collect the observations which he classifies and employs so as to make them of special interest with regard to each individual species.

The controversy, not long ago revived, and carried on partly in this journal during 1869 and 1870 by Prof. Newton, concerning the eggs of the Cuckoo, makes the chapter devoted to that bird of special interest. On the subject of whether the hen bird is in the habit of always laying her eggs in nests of the same species of foster parent, Prof. Newton remarks (NATURE, vol. i. p. 75), "without attributing any wonderful sagacity to the Cuckoo, it does seem likely that the bird which once successfully deposited her eggs in a Reed Wren's, or a Titlark's nest (as the case may be) when she had an egg to dispose of, and that she should continue her practice from one season to another. We know that year after year the same migratory bird will return to the same locality, and build its nest in almost the same spot. Though the Cuckoo be

somewhat of a vagrant, there is no improbability of her being subject to so much regularity of habit, and indeed such has been asserted as an observed fact. If, then, this be so, there is every probability of her offspring inheriting the same habit, and the daughter of a Cuckoo which always placed her egg in a Reed Wren's or a Titlark's nest doing the like." To this Mr. Harting very justly replies—"This would be an excellent argument in support of the theory (of Dr. Baldamus) were it not for one expression, upon which the whole value of the argument seems to me to depend. What is meant by the expression 'Once successfully deposited?' Does the Cuckoo ever revisit a nest in which she has placed an egg and satisfy herself that her offspring is hatched and cared for? If not (and I believe such an event is not usual, if indeed it has ever been known to occur), then nothing has been gained by the selection of a Reed Wren's or Titlark's nest (as the case may be), and the Cuckoo can have no reason for continuing the practice of using the same kind of nest from one season to another." Mr. Harting therefore rejects the application of this principle in the case of the Cuckoo. We will suggest to him a modification of Prof. Newton's argument which may perhaps lead him to return to it in its modified form. The assumption that the bird which once successfully deposited her eggs in a Reed Wren's or Titlark's nest, would again seek for one of the same species in other seasons because of her sagacity, or her knowledge of its successful hatching, is highly improbable in our estimation, and not essential for the subsequent deductions, in a Darwinian point of view. It is more logical to suppose that ancestral Cuckoos deposited their eggs broadcast. That those which got into Reed Wren's and Titlark's nests (as in instances) all, or nearly all, hatched out; whilst those deposited elsewhere perished. The young *inherited* those peculiarities of the mother birds whose tendency was towards the utilisation of the Reed Wren's and Titlark's nests, and as a result the modern Cuckoo tends to place its eggs in those nests.

The evidently genuine sketch made by Mrs. Blackburn of the nestling Cuckoo ejecting the young of the Titlark along with which it was hatched, first published in the introduction to Gould's "Birds of Great Britain," is introduced as confirmatory evidence in favour of this, to the foster-brethren, murderous propensity of the young birds, with reference to which so many naturalists are still sceptical.

The peculiarity in the distribution of the Nightingale in this country is difficult to explain, especially as the Wryneck keeps within nearly the same boundaries. "When we find this bird in summer as far to the westward as Spain and Portugal, and as far to the northward as Sweden, we may well be surprised at its absence from Wales, Ireland, and Scotland; and yet it is the fact that the boundary line, over which it seldom if ever flies, excludes it from Cornwall, West Devon; part of Somerset, Gloucester, and Hereford; the whole of Wales (*a fortiori* from Ireland), part of Shropshire, the whole of Cheshire, Westmoreland, Cumberland, Durham, and Northumberland." From these data it is not difficult to recognise that with but few exceptions the Nightingale only visits those parts of this country which are covered with secondary or tertiary geological formations; and it

has always seemed to us that it must be that the primary soils do not produce food suitable for the insects on which it feeds. It is true that the new red sandstone is the soil of Cheshire, and that much of Yorkshire and Derbyshire are primary formations, nevertheless the two boundaries are so similar in other respects that it is hardly possible that there is no relation between them.

There is another disputed point to which the author more than once alludes. He remarks that "we cannot help thinking that the Nightingale and many other birds which visit us in summer and nest with us, must also nest in what we term their winter-quarters; otherwise it would be impossible, considering the immense number which are captured on their first arrival, not only in England, but throughout central and southern Europe, to account for the apparently undiminished forces which reappear in the succeeding spring." The late Mr. Blyth was of an opposite opinion, and further observations are necessary before this question can be settled.

Besides the information given on subjects like the above, the nest and eggs of all the species, fifty in number, are described; whilst exact measurements are included of closely allied forms, such as the Wood Warbler, the Willow Warbler, and the Chiff Chaff; the Red Warbler, the March Warbler, &c. Their plumage and nests are also compared in detail.

To those who reside in the country and are fond of the study of nature, this work by Mr. Harting will be found as useful an addition to their libraries or their drawing-room tables, as it will be to ornithologists generally.

OUR BOOK SHELF

Meteorology of West Cornwall and Scilly, 1871 and 1874.
By W. P. Dymond. (Reprinted from the Annual Reports of the Royal Cornwall Polytechnic Society, Falmouth.)

In the latter of these pamphlets Mr. Dymond gives an interesting discussion of the temperature range corrections for Falmouth, and an excellent *résumé* of the sea-temperature observations made at the same place during the three years 1872-73-74, which have been made with a just apprehension of the precautions which require to be taken, if observations of sea temperature are to have real scientific value. The omission of tables of daily maximum and minimum atmospheric pressure, which were given in the earlier issue, is a decided improvement; not so, however, is the omission of the table of the amounts of the rainfall, with the different winds, N., N.E., E., &c., which supply information of great value in defining local climates.

The five stations reported on are Scilly, Helston, Falmouth, Truro, and Bodmin, of which the most northern, as well as most elevated, is Bodmin. If we compare the mean temperatures of the stations for 1874, it is seen that at Bodmin the mean was 53°.3, and at Falmouth only 51°.8. In some of the months the discrepancy is still greater. Thus the mean temperature of Bodmin is about four degrees higher than that of Falmouth in each of the months from April to July inclusive, and about two degrees higher than at Truro, Helston, or Scilly. It is unnecessary to remark that these differences do not represent the differences of the climates of these places, but are to a very large extent only due to the incomparable modes of observation and of reduction of the observations adopted for the several stations. Thus, as regards the exposure of the thermometers, at Bodmin they are hung four-and-a-half feet above the ground, under a thatch